

## **HUMMINGBIRD FEEDER**

This application is a non-provisional application of earlier filed provisional application No. 60/407,632 entitled "Humming Bird Feeder", filed on behalf of Joseph David Coburn and Joel Ralph Bernhardt on September 3, 2002.

### **Field of the Invention**

The present invention relates to bird feeders and more particularly to a hummingbird feeder and its use.

### **Background of the Invention**

It is difficult (if not impossible) to maintain a feeding cup in a hummingbird feeder free from contaminates. Insects, wind blown debris and other undesirable materials contaminate the feed source so that it becomes unsightly, as well as being unhealthy to the feeding birds. In many instances, the contamination also contaminates the feed reservoir. The Patent literature abounds with alleged solutions to the contamination problems with bird feeders. For example, U.S. Patent No. 4,980,990 to Hiday discloses a insect trap used in combination with a bird feeder having a water barrier to cut off insect infestation into the bird feeder. The Hiday patent trap includes a water receiving cavity having a base wall, a side wall and a stem with a means for positioning the insect trap between a hanger and the bird feeder so as to prevent movement of insects beyond the trap. U.S. Patent No. 5,247,904 to Anderson discloses a hummingbird feeder having a divider wall and support posts which support the hummingbird feeder and prevent crawling insects from accessing into the surrounding body of fluid. In U.S. Patent No. 5,450,816 to Santa Cruz, there is disclosed a tubular design for a humming bird feeder with a limited capacity fluid chamber so as to prevent spoilage of a water/sugar solution. In another patent, U.S. Patent No. 5,454,348 to Colwell, et al, there is disclosed a hummingbird feeder having a top wall, a bottom wall, and the top and bottom walls join at the ends to create an enclosure for a reservoir. The feeder is provided with a cleaning opening which is large enough to facilitate cleaning of the reservoir, and a removable cap for cleaning the opening. U.S. Patent No. 6,318,290 B1 to Fisher discloses an automatic bird feeder and waterer which contain both a food and a water reservoir for supplying food and water in dispersed portions. Another U.S. Patent No. 6,499,430 B2 to Garcia-Lucio, et

al discloses a feeding tube used with a hummingbird feeder having a design of a imitation flower. Additionally, U.S. Patent No. 6,553,936 B2 to Sasso discloses a hummingbird feeder that includes a storage vessel for fluid, such as nectar, and an attached portion for feeding. Lastly, U.S. Patent Appl 2001/0029899 to Arlitt discloses a hummingbird feeder which may be disassembled for  
5 cleaning.

None-the-less, there still exists a need for a liquid bird feeder, such as a hummingbird feeder, which may be readily cleansed of undesirable debris and insect infestation by mechanical flushing of the contaminates therefrom without requiring manual intervention into the feeding cup or feeding reservoir.

### **Summary of the Invention**

The present invention provides a liquid bird feeder which may be readily cleansed by flushing unwanted debris and contaminates from a feeding cup. The hummingbird feeder includes a feed reservoir for retaining a liquid feed reserve (such as a sugared nectar) essentially protected from insect penetration, a feeding cup from which the bird may feed upon the liquid feed, a pump  
15 for pumping the liquid feed from the feed reservoir to the feeding cup and an overflow trap positioned so as to capture undesirable contaminates which are flushed from the feeding cup by overflowing the feeding cup with the liquid feed. Cleansing of the feeding cup may be accomplished by pumping excess liquid feed into the feeding cup causing an overrun of liquid feed laden with contaminates onto the overflow trap. The hummingbird feeder of the present invention  
20 also provides a method for flushing liquid feed contaminates and debris from the hummingbird feeding cup by pumping liquid feed to the feeding cup causing the contaminates to overflow from the feeding cup and run onto the overflow trap.

### **Brief Description of the Drawings**

Figure 1 is a side view of a hummingbird feeder of this invention.

Figure 2 is a vertical bisectonal view of the feeder shown in Figure 1.

Figure 3 is a top view of the feeder shown in Figure 1.

Figure 4 is an enlarged and exploded cross sectional view of the upper portion of the bird feeder shown in Figure 2.

Figure 5 is a side view depicting another embodiment of the bird feeder shown in Figure 1.  
Figure 6 is a bisectonal view of Figure 5.

### **Detailed Description of the Invention**

With references to the accompanying Figures, the present invention provides a  
5 hummingbird feeder 1 comprised of a feed reservoir 3 for retaining liquid feed F, a feeding cup 5  
for feeding the liquid feed F to a feeding bird (not shown), a pump 7 for pumping the liquid feed  
F from the feed reservoir 3 to the feeding cup 5 and an overflow trap (generally identified as 9)  
positioned so as to capture the feed contaminates X flushed from the feeding cup 5 by pumping  
excess liquid feed F into the feeding cup 5 causing a feed F overrun. With reference particularly  
10 to the figures, the basic operating features of the hummingbird feeder 1 includes a feed reservoir 3  
for a sugared solution F, a pump 7, a conduit (generally identified as 11) for pumping the sugared  
solution F to the feeding cup 5 and an overflow trap (generally referred as 9). The bird feeder 1  
as depicted by Figures 1-4 portrays a potted plant container 13 simulating a plant pot which  
serves not only as a supportive base but also as a holding container or housing for feed reservoir 3  
15 containing the sugared water feed supply F and as a housing overflow trap tank 33 for holding or  
retaining the overflow contaminates X. A protective pot covering lid 14 rests upon rims 18 of the  
plant pot 13 to securely retain both the sugared solution and overflow contaminates from external  
invasion. Internally, the simulated pot 13 includes a socketed post 15 for posting waste return  
column 17 which in turn serves as waste conduit for overflow trap 9.

20 Pumping means 7 for pumping feed F to the feeding cup 5 may be any type of pump (e.g.  
mechanical, electrical, hydraulic, etc.) capable of pumping fluid feed F from the reservoir 3 to the  
feeding cup 5. A reed pump or bulb primer such as commonly used for the priming of small  
internal combustion motors and outboards or a manual hand pump equipped with a ball and check  
valve as commonly used to pump liquid soaps, hand lotions, etc., from an enclosed container are  
25 cost effective and may be effectively utilized for this purpose. Similarly, a rubber bulb hand pump  
fitted with a check valve or alternatively, a power operated mechanical pump equipped with a  
sensing means to regulate the flow of sugared solution to the feeding cup 5 may also be utilized  
for this purpose. If desired, electronic pumps fitted with pumping sensors such as a light sensor,

time delayed feed cup capacity sensors to detect feed levels etc. may likewise be used to trigger the supply pumped feed **F** to the feed cup **5**.

In the feeder shown in Figures 1-4, plastic conduits **11B** & **11A** positioned before and after pump **7** are used to conduct the pumped fluid **F** to the funneled shaped feeding cup **5** from feed reservoir **3**. It will be observed from Figure 2 that the feed conduit **11A** is housed within the return trap conduit **17** and is attached to the feed end of the funnel shaped sugared water solution feeding cup **5**. The funnel shaped feeding cup **5** is jacketed by a funnel shaped trap jacket **15A** (which is an over-all part of trap **9**) and may be seated by two or more ribs **19** (two shown and two occluded from view) adapted to separate the funnel shaped jacket **15A** from the feeding cup **5** so as to permit the overflow of contaminates from the feeding cup **5** to the waste return trap conduit **17**. A closing lid **23** (e.g. snap-on, threaded, etc.) having a periphery flanged lip **25** secures onto a lipped rim **26** of jacket **15A** to provide a closed feeding system with feeding access porting through the feeding holes **27** of lid **23**. The lid **23** includes a lid handle **24** for easy access and removal. Feeding lid **23** also may be designed to simply screw or twist on or off the jacketed trap **15A** or snap-on. As illustrated in Figure 1-4, feeder **1** may be appropriately decorated with flower shaped pedals **29** to provide a decorative flower configuration. If desired, a feeding post **22** for posting the bird may be optionally included. The exploded cross-sectional view of the funnel jacket **15A** and feeder cup **5** of Figure 4 with lid **23** removed shows in greater detail the feeding cup **5** with feed conduit **11** surrounded by funnel shaped trap jacket **15A** and trap return column **17** of overflow trap **9**. Funnel shaped trap jacket **15** includes an apertured base **15B** which allows overflow contaminates to flow into return trap conduit **17**.

The overflow trap **9** features of feeder **1** may be better understood by referring in particular to Figures 2, 4 & 6. As may be observed from Figures 2 & 4, the funnel shaped feeding cup **5** is concentrically housed within funnel shaped jacket **15A** with the feeding cup brim **5B** being positioned below feeding lid **23** so as to permit an overflowing of contaminated feed **X** onto jacket **15A** by the pumping of excess feed **F** into feed cup **5**. As may be further visualized from Figures 2 & 4, the overflowing feed **F** gravitationally overflows onto funnel shaped jacket **15A** which then funnels the overflow contaminates **X** into return trap conduit **17** which in turn leads

onto trap ports **31** porting onto contaminant trap tank **33**. When it is desired to either remove and clean the overflow trap tank **33** or add fresh feed reservoir **3**, the pump **7** may be separated from the conduit **11B** and waste return column **17** from post jacket **15** allowing for the removal of covering lid **13**, thus providing access to both contaminant trap tank **33** and the feed reservoir **3**.

5           With particular reference, the Figure 6 cross-sectional view shows a feeder **1** which differs in appearance but functions in the similar manner to feeder **1** of Figures 1-4. Excess feed (**F**) is pumped with pump **7** from fresh feed reservoir **3** through feed conduit **11a** causing feeding cup **5** to overflow, spilling excess feed onto angled trap jacket **15A** which guides the spilled and usually contaminated feed onto trap column **17** which is supported by waste column support **17A**. The  
10       trapped contaminates of spilled feed is piped from trap column **17** through contaminate discharge pipe **25p** which discharges the contaminated feed into waste discharge tank **33**.

          The feeder **1** as depicted in Figures 5 & 6 basically embodies the same overflow features of the feeder **1** shown in Figures 1-4. The feeder **1** similarly includes what is shown as a supportive base **13B** depicted as a flat base (as opposed to the plant pot **13** support base of  
15       Figures 1-4) which serves as a base **13B** for feeder **1**. Similar to the Figure 1-4 feeder **1**, the feeding cup **5** is housed within overflow trap **9** as shown in Figures 1-4.

          The base **13B** supports the waste contaminant tank **33**, the feed reservoir **3** and trap return column **17** which serves as a mount for the feeding cup **5** and collector for overflow trap **9**. With particular reference to Figure 6, it will be observed that the feeding cup **5** is also housed within  
20       the contaminate overflow trap **9** is bordered at the initial waste collecting site by an angular pipe tube **15A** such as a pipe fitting equipped with a lid **23** having a lip **25** and a feeding orifice **27** positioned so as to provide access to the feeding cup **5** by the feeding bird. Similar to the overflow attributes of the Figure 1-4 feeder, the feeding cup **5** is housed within the waste return column **17** with a feeding brim **5B** positioned so as to allow the overflow feed to flow into trap  
25       collector **15A** of the overflow trap housing **9**. Trap column **17** serves dually to house the feed conduit **11a** and as the waste return. As may be further observed, the waste return column **17** includes a coupling stop barrier **17B** which collects the overflow contaminates for transfer onto waste conduit **32** to waste tank **33**.

The illustrated pump 7 of Figures 5-6 may be of the type commonly utilized to dispense in common household soaps and hand lotions wherein the user simply manually pumps by hand the fluid feed F from the feed reservoir 3 through the feed conduits 11A & 11B onto feed cup 5.

Base 13B is grooved or bored so as to receive waste column support 17A coupled onto waste column return 17 with coupling stop barrier 17B. The feed reservoir 3 and the contaminant trap tank 33 are equipped with lids 37 & 39 to seal tanks 3 & 33 from infestation by insects which respectively mate onto the pump conduit 11B and feed reservoir 3 and the waste return conduit 32 to waste tank 33. In the same fashion as Figures 1-4, pumping pump 7 provides excess fluid to the feeding cup 5 causing the feeding cup liquids to overflow therefrom and return through the trap system 9 of the invention to contaminant tank 33.

The feeders 1 of Figures 1-6 may be constructed of commonly available materials. Commonly available pipe fittings may be utilized to create the feed reservoir 3 and the holding tank trap 9 for the Figure 5 and 6 feeder. Accordingly, commonly available plastic conduits, pumps etc. may be readily adapted to the feeder 1 construction.